



MT DNRC 7th Annual Floodplain Resources Seminar



Communication for Floodplain Projects:

**“It hasn’t flooded here in the 10 years
I’ve owned this place”**

By Dan March



Drawing from experience from:

- 27 years of consulting experience
- 13 County-Wide DFIRM/RiskMAP projects
- Conservation District inspections and technical assistance

Items Covered

1. What make a good project?
 - River/floodplain function
2. What data is needed and where do you find data for a project
3. Who to communicate with?
 - Permits
4. Response to common and/or difficult questions

What makes a good stream project?

- Preserves or enhances natural function of a river or stream
- Has minimal or no maintenance (\$\$\$)
- Lower initial cost
- Aesthetics
- No impact or positive impact to upstream and downstream neighbors



What makes a good stream project?

- <http://dnrc.mt.gov/licenses-and-permits/stream-permitting-book/intro.pdf>

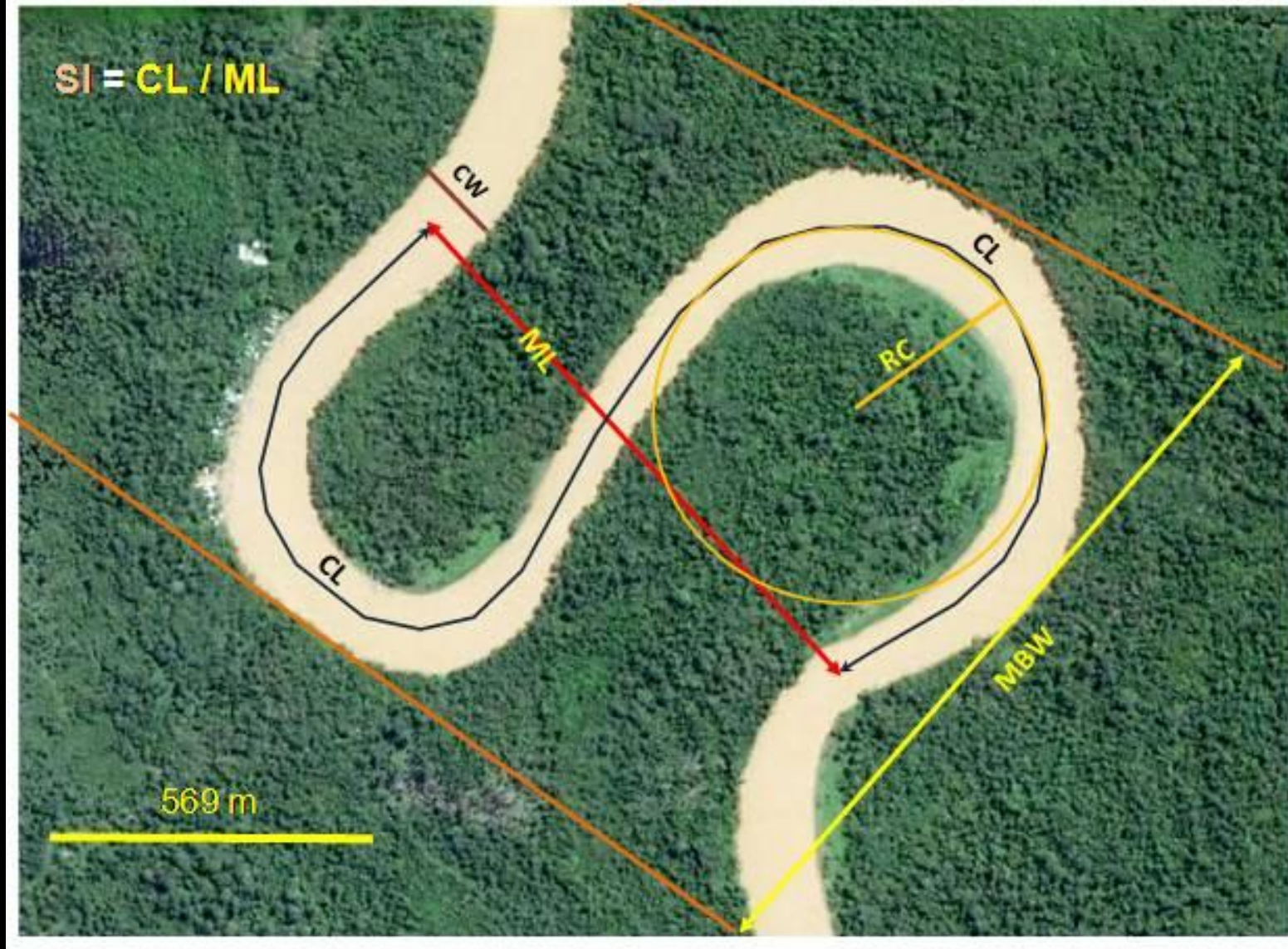
Montana Stream Permitting

A Guide for Conservation District
Supervisors and Others

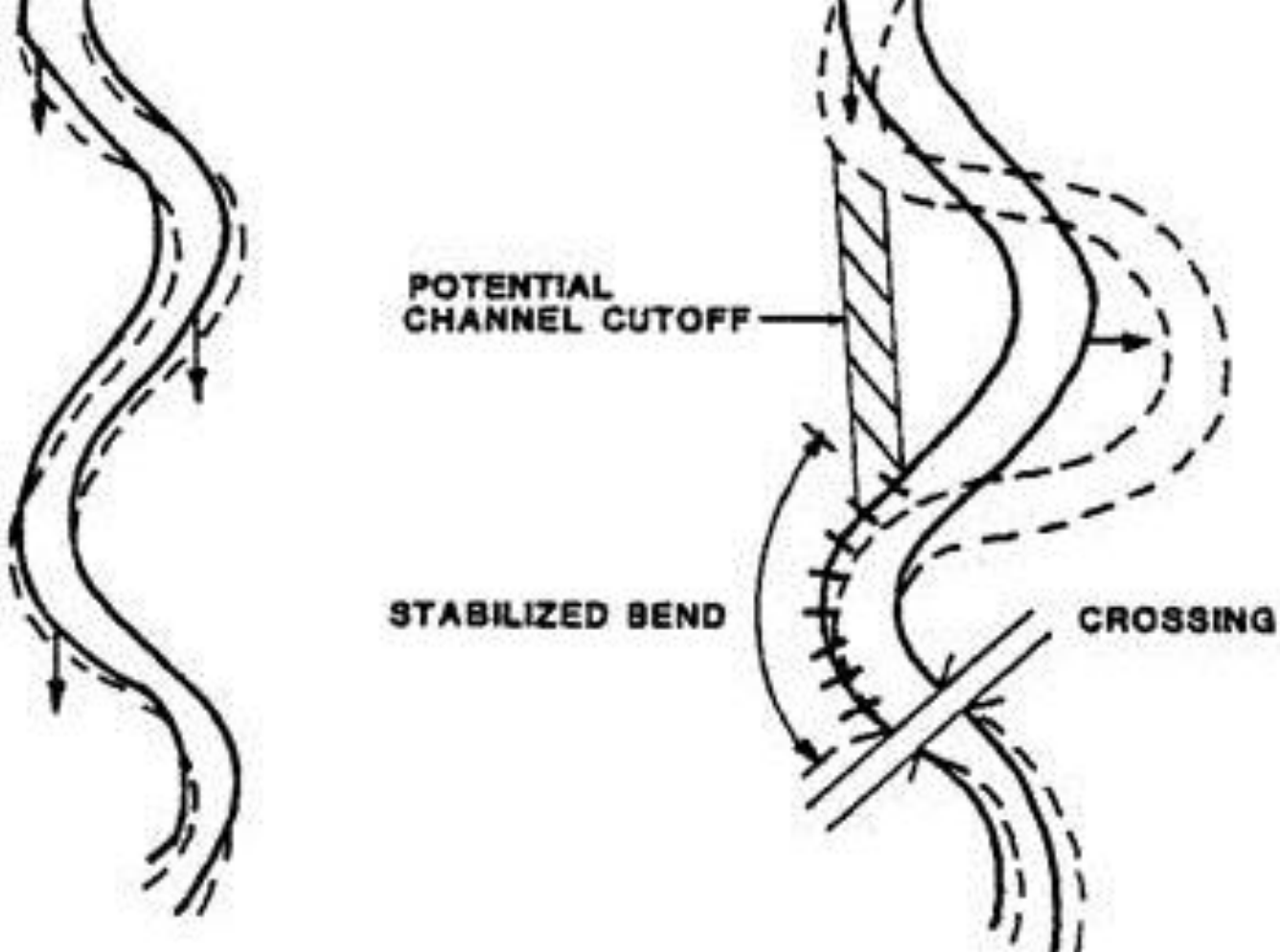


Conservation Districts Bureau
Montana Department of
Natural Resources and Conservation

June 2001



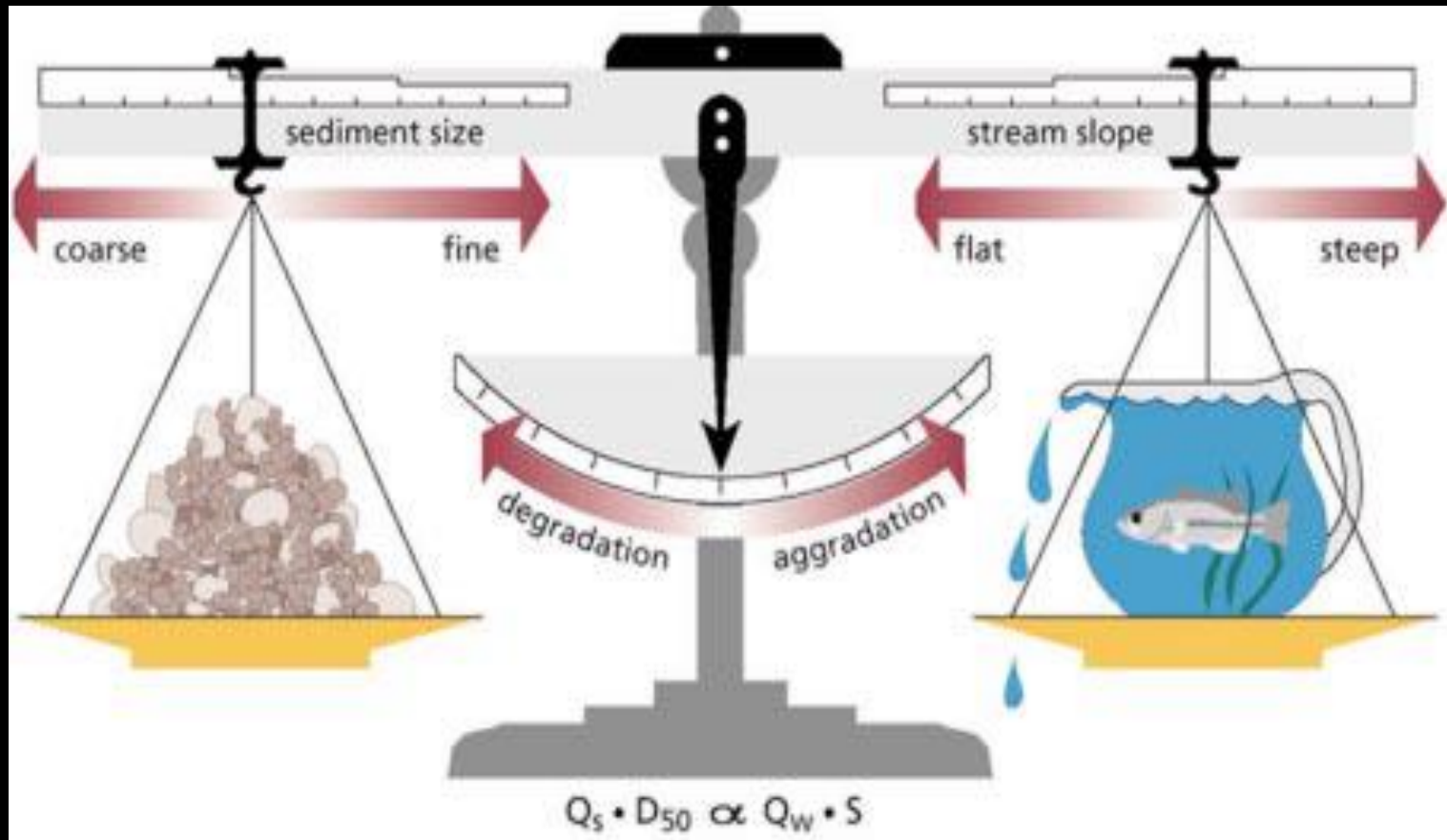
Channel Function:
Belt Width Considerations



Channel Function:

Belt Width Considerations

Channel Function: Lane's Diagram



(sediment quantity) x (sediment size) proportional to (water discharge) x (stream slope)

Channel Function: Bank Failure Methods

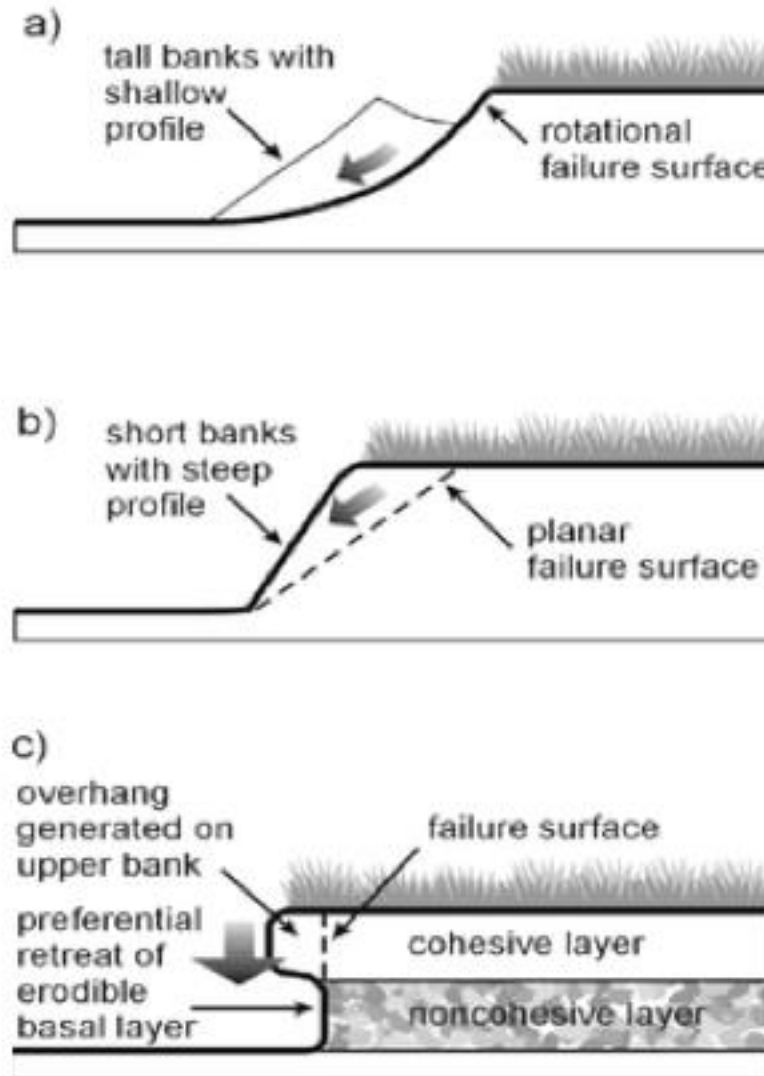


Figure 8 – Mass Bank Failure Types (Simon et. al., BSTEM5.2)

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Example Projects

Bank Stabilization









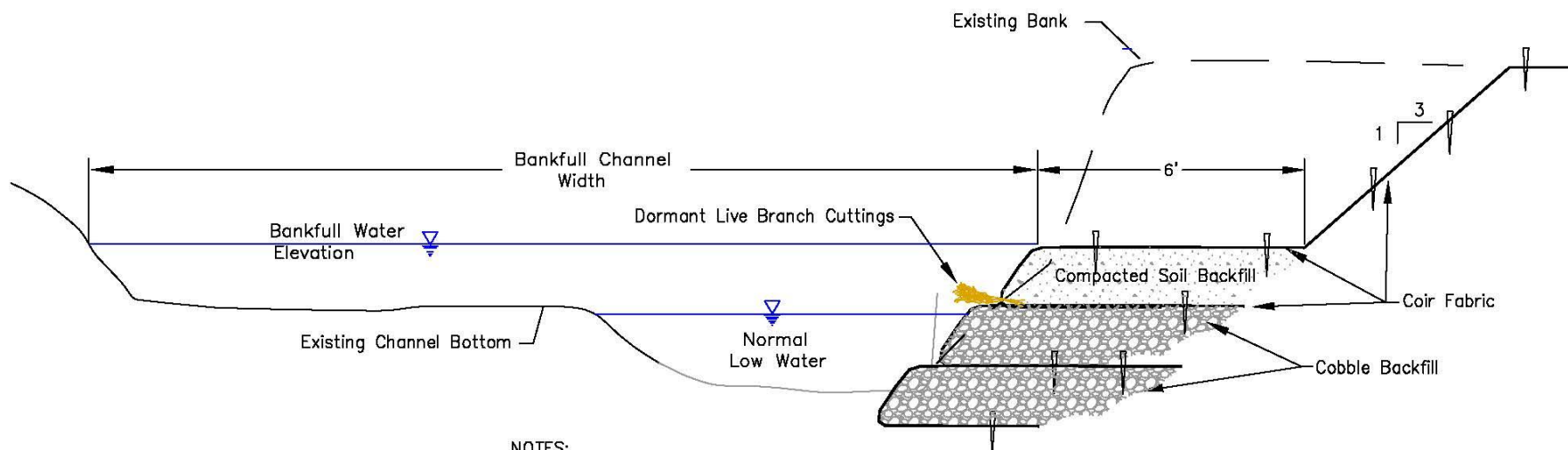






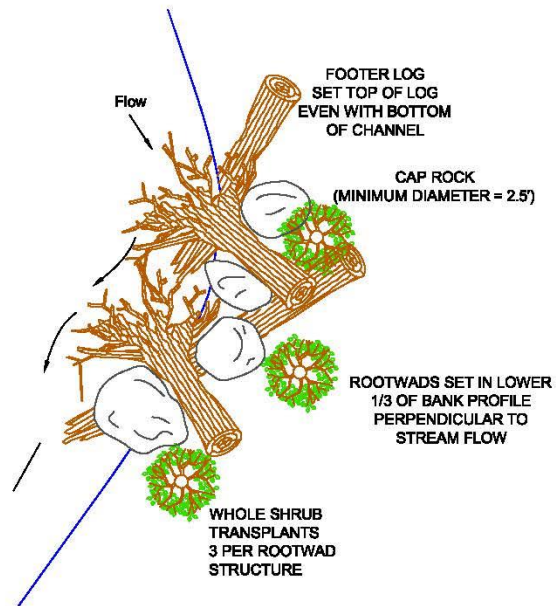
NOTES:

1. Drawing is looking downstream with vegetated encapsulated soil layers on right bank.
2. Use of woven coir erosion control fabric minimum weight of 900 grams/square meter or approved equivalent. (ie Delowe 900 or Bio D Mat 90 from Rolanka) Use 4 meter wide rolls.
3. Seed beneath upper layer of erosion control fabric.

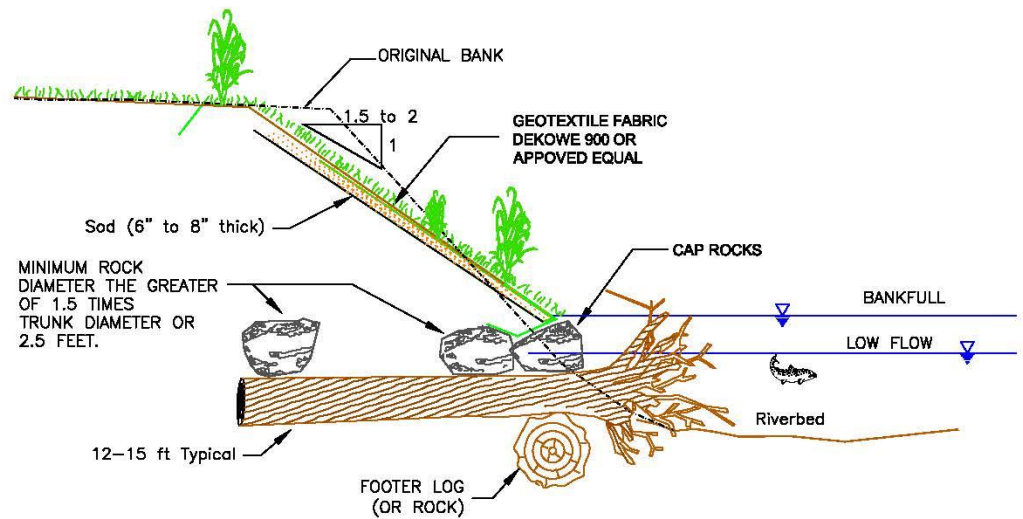


NOTES:

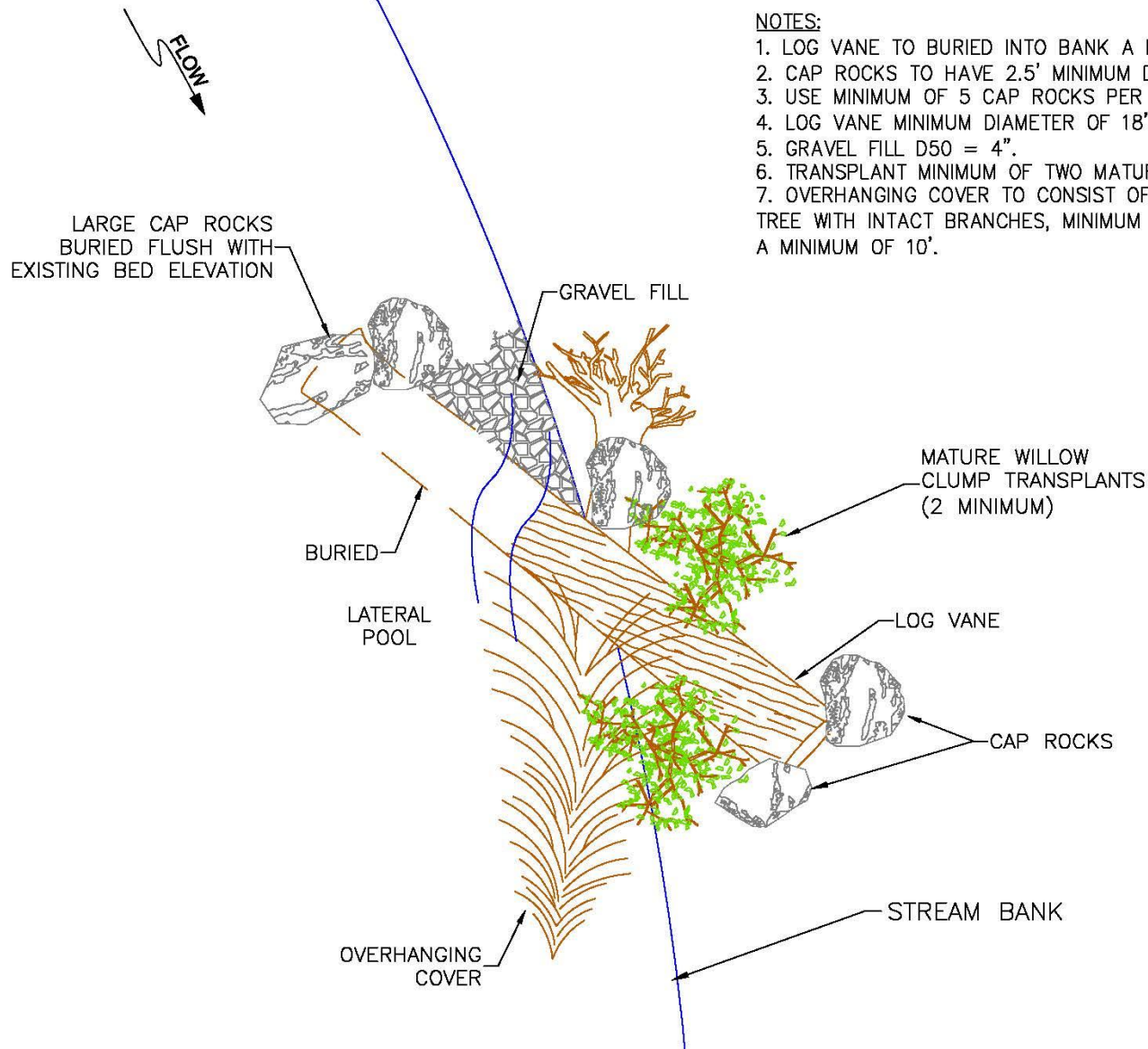
1. Clear and grade the toe of the streambank.
2. Construct cobble filled coir wraps to an elevation above the low water elevation. Lifts should be 12"-18" thick.
3. Place 2" of soil on top of coir and level.
4. If water level is below soil surface, place cuttings on the soil layer. If the soil surface is at the water level, do not plant at this time.
5. Install a coir fabric encapsulated soil layer. Typical heights anchor coir before and after wrapping the soil layer. On the very top layer, spread grass seed under coir fabric.
6. Use Dekowe 900 woven coir fabric for wraps.
7. Backfill wraps below low water elevation with 6" cobble/gravel mix.



PLAN VIEW



CROSS SECTION



NOTES:

1. LOG VANE TO BE BURIED INTO BANK A MINIMUM OF 10'-15'.
2. CAP ROCKS TO HAVE 2.5' MINIMUM DIAMETER.
3. USE MINIMUM OF 5 CAP ROCKS PER STRUCTURE.
4. LOG VANE MINIMUM DIAMETER OF 18" AND MINIMUM LENGTH OF 25'.
5. GRAVEL FILL D50 = 4".
6. TRANSPLANT MINIMUM OF TWO MATURE WILLOW CLUMPS PER STRUCTURE.
7. OVERHANGING COVER TO CONSIST OF A FRESHLY HARVESTED CONIFEROUS TREE WITH INTACT BRANCHES, MINIMUM LENGTH OF 20', BURY INTO BANK A MINIMUM OF 10'.

Example Projects

Bridges/Culverts/Fords

Bridges/Culverts/Fords Design and Location Considerations

- Channel geometry (vertical/horizontal stability, location)
- Peak flow capacity, scour depth, and erosion
- Bedload, ice, woody debris passage
- Fish passage
- Road approach grade
- Relative cost
- Potential upstream and downstream effects



















Example Projects

In-Stream Ponds/Pool Construction

In-Stream Ponds/Pool Construction

- Sediment traps
 - Tubifex worms (host whirling disease parasite)
 - Solar collectors
 - Require periodic maintenance
-
- Pools need to be self maintaining with hydraulic scouring.









What data is needed and where do you find data for a project?

- Topography
 - LiDAR sources
- Field Survey
- Hydrology
- Hydraulic model
- Floodplain maps



Available LiDAR Data

- <http://coast.noaa.gov/inventory/>



Available LiDAR Data

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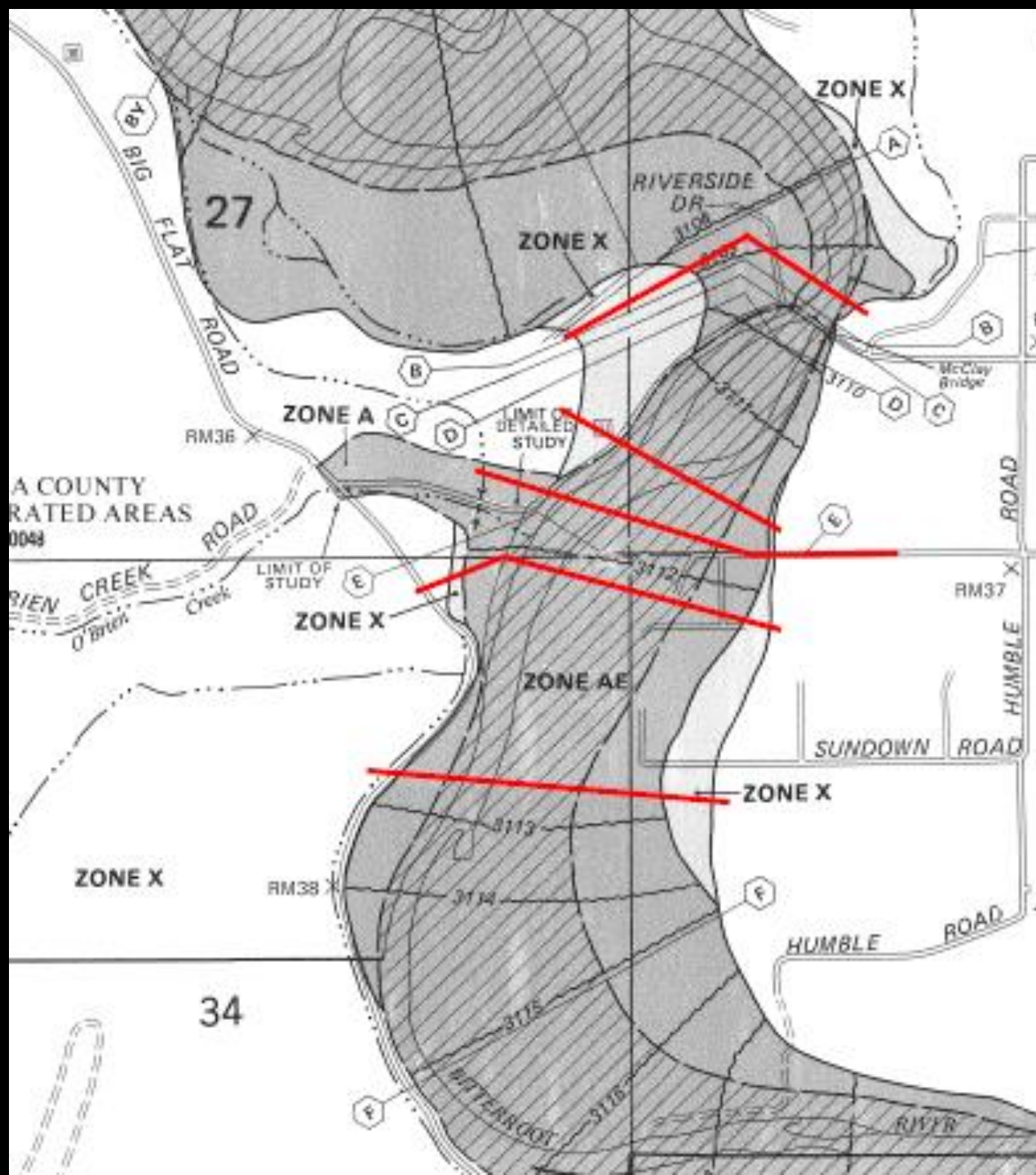


Field Survey

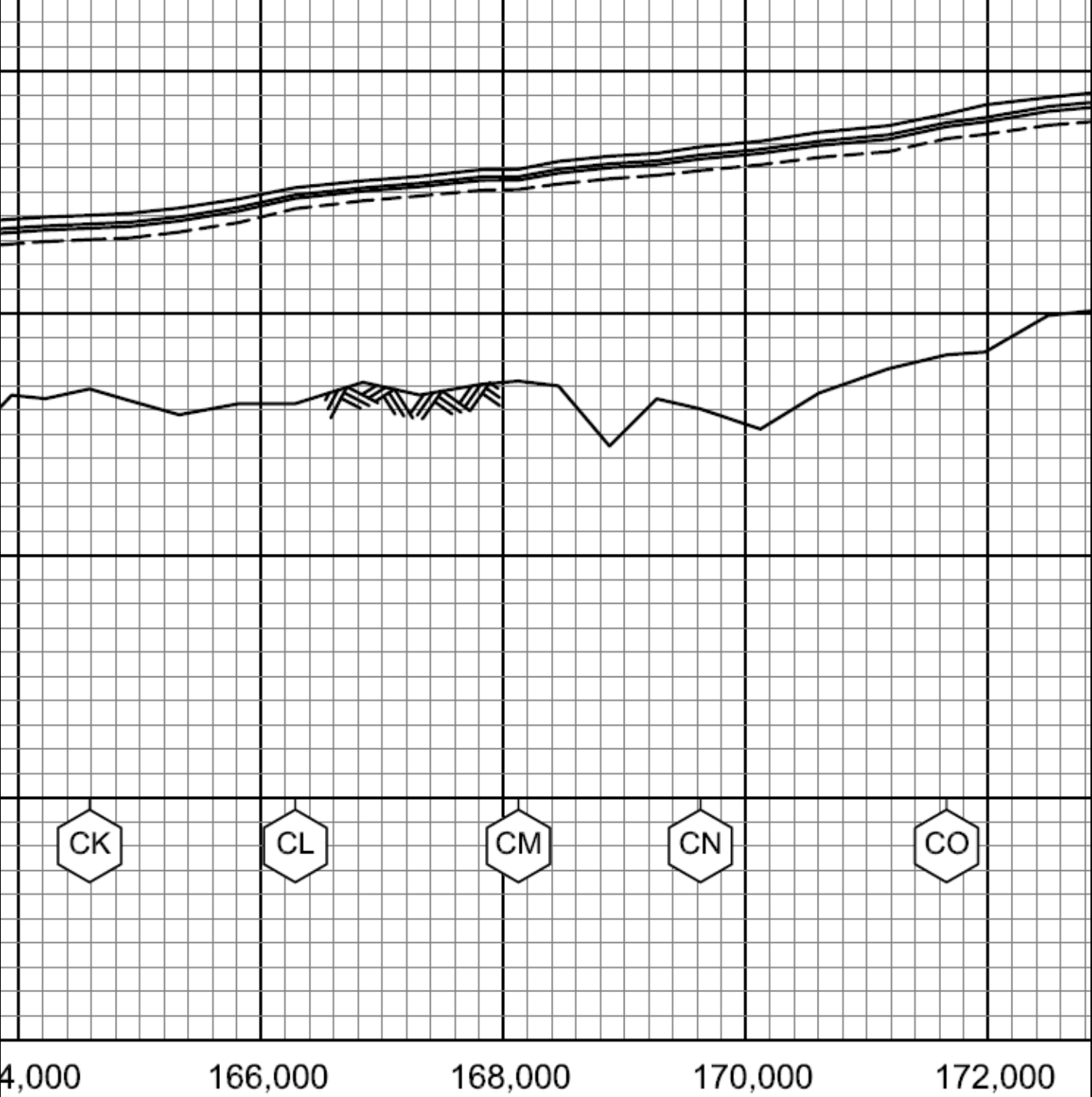
- If there is a bridge, Montana Department of Transportation will have as-built plans
- FEMA Engineering Library might have topographic data from previous studies (<https://www.fema.gov/engineering-library>)
- Likely need to collect current data
- Match cross section locations for effective floodplain map plus extras at your project location
- Note that all cross sections used for original hydraulic model may not appear on the effective floodplain map



Field Survey



Field Survey



Hydrology

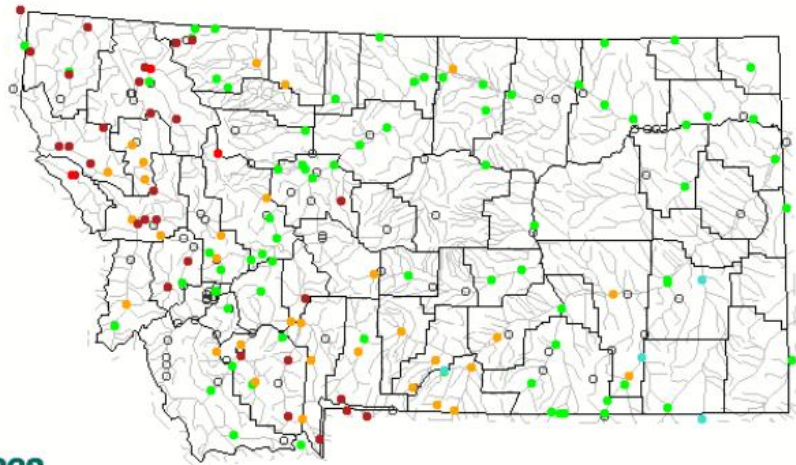
<http://waterwatch.usgs.gov/?m=real&r=mt>

[Map](#) | [Map \(HCDN\)](#) | [Flow Table](#) | [Summary Plot](#) | [Percent Summary](#) | [Summary Table](#) | [Web Map](#) | [Google Earth](#)

Map of real-time streamflow compared to historical streamflow for the day of the year (Montana)

Montana ▼ or Water-Resources Regions ▼

Hednesday, July 22, 2015 13:00ET



Choose a data retrieval option and select a location on the map

☐ List of all stations ☒ Single station ☐ Nearest stations ☐ Peak flow

Explanation - Percentile classes

Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Hydrology

<http://pubs.usgs.gov/wri/wri03-4308/>

Historic data analysis through Water Year 1998

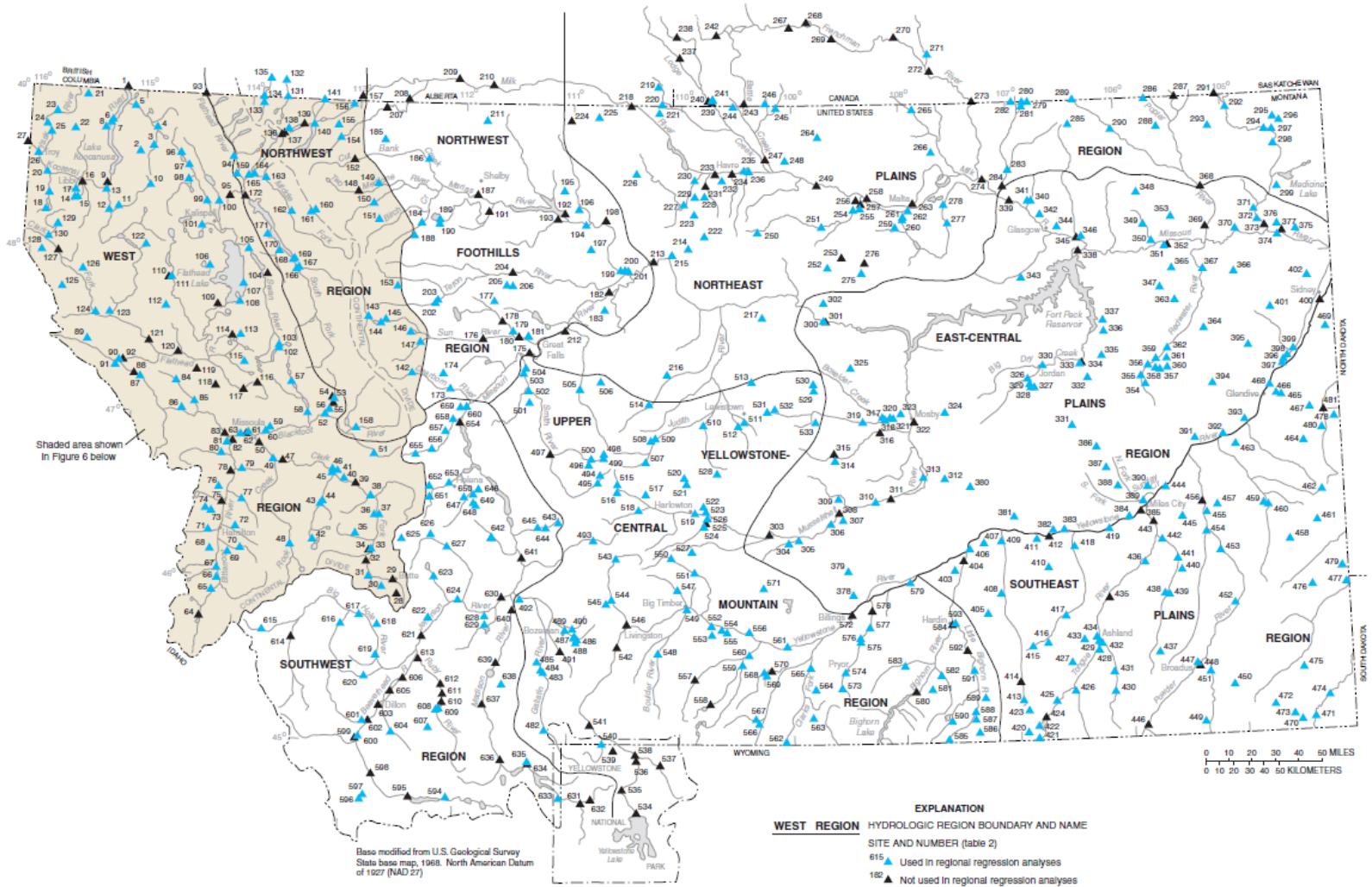


Figure 1. Hydrologic regions and streamflow-gaging stations having compiled flood-frequency characteristics, Montana and adjacent areas in Idaho, Wyoming, and Canada.

Hydraulics

- DNRC
- FEMA Engineering Library
 - <https://www.fema.gov/engineering-library>

Current Fee Schedule for Requests for Flood Insurance Study Backup Data

The current fee schedule for requests for Flood Insurance Study (FIS) backup (i.e., technical and administrative support) data is provided below in 7 separate categories:

REQUESTS FOR FLOOD INSURANCE BACKUP DATA	FEE
1. Portable Document Format (PDF) or Diskettes of hydrologic and hydraulic backup data for current or historical FISs	\$300, plus a \$93 per-case surcharge fee to recover the cost of library maintenance and archiving. For larger requests that require more than 4 hours of research, additional hours will be charged at \$40 per hour. View below for additional fee information on this request .

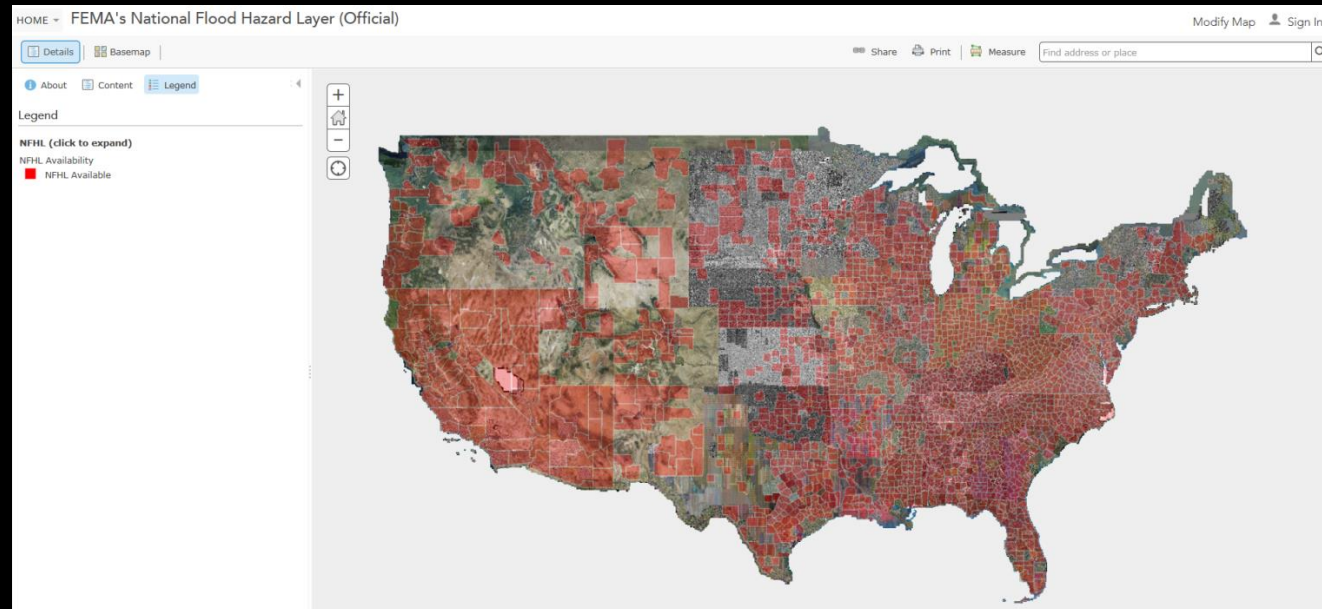
- State NRCS office in Bozeman

Floodplain Maps

- Local Floodplain Administrator
- FEMA Map Service Center
 - <http://msc.fema.gov/portal/search?>
 - DFIRM and FIRM maps



- National Flood Hazard Layer
 - <http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cbe088e7c8704464aa0fc34eb99e7f30>
 - GIS data
 - Google Earth compatible



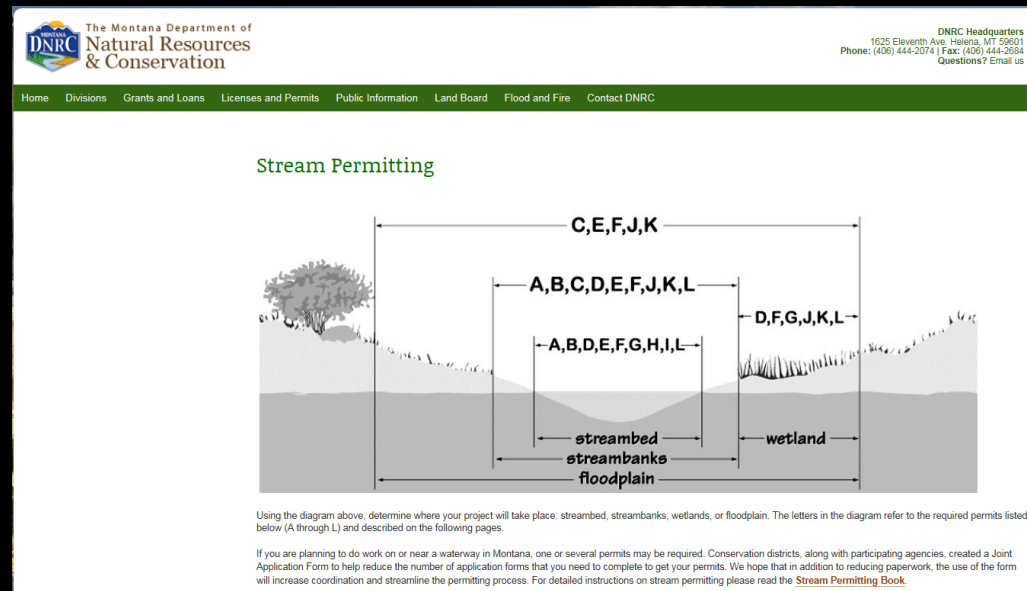
Who to communicate with?

- Landowner
- Adjacent Landowners
- Permitting agencies



Who to communicate with?

- Who requires a permit?
 - <http://dnrc.mt.gov/licenses-and-permits/stream-permitting>
- Montana Natural Streambed and Land Preservation Act (310 Permit) – County Conservation District
- Montana Stream Protection Act (SPA 124 Permit) – Fish, Wildlife & Parks
- City or County Floodplain Development Permit (FPA)
- Federal Clean Water Act (404 Permit) – Corps of Engineers
- Federal Rivers and Harbors Act (Section 10 Permit) – Corps of Engineers
- Short-Term Water Quality Standard for Turbidity (318 Authorization) Montana DEQ
- More.....



Response to Common or Difficult Questions

- Opportunity to educate
- Opportunity to stop rumor mill
- Opportunity to create educated public to help spread the word (or at least stop the disinformation)



Question/Comment

- “The last 100-year flood was 96 years ago so I plan to keep my flood insurance for another four years then let it lapse.”

Response

- “100-year Flood” is a misnomer
- “1-percent annual chance flood” is more accurate.
- 1% chance of a flood that size or larger in any given year.
- Can happen twice in one year

Question/Comment

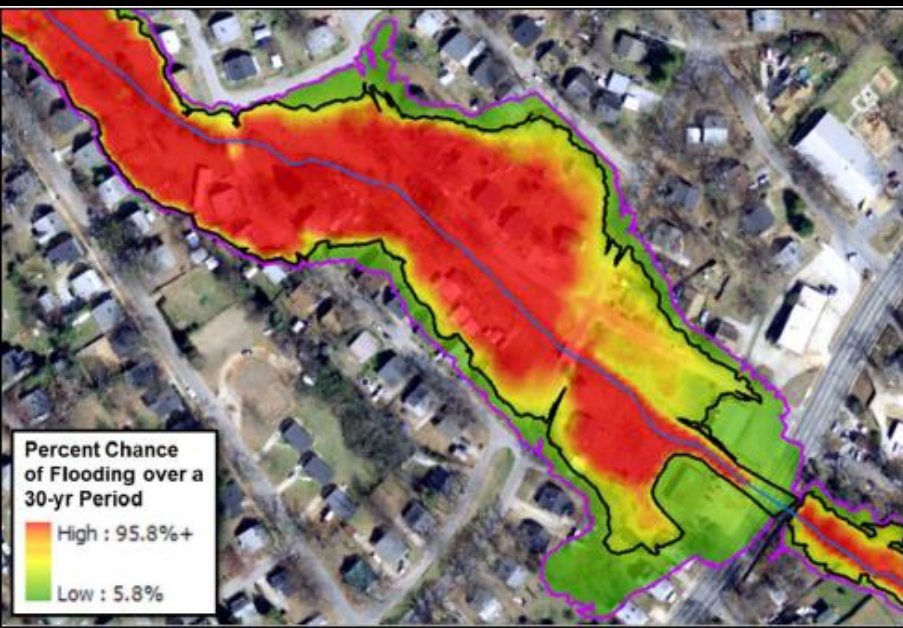
- “Flood Insurance is a scam by the government to raise money.”

Response

- The National Flood Insurance Program is losing money.
- Flood insurance is subsidized by those not living in the floodplain
- Private flood insurance doesn't exist due to subsidized federal flood insurance.

Question/Comment

- It's my house and I shouldn't be forced to buy flood insurance.



Response

- If it is truly your house you don't have to buy flood insurance. You can make the decision to take that risk.
- If you don't own your house (i.e. have a federally backed mortgage) your bank requires you to insure their investment.
- This is the same if you have a loan on your car. The lender wants to ensure that their investment will be paid back.
- Statistically there is a 26% a 100-year flood will occur over the course of a typical 30-year mortgage.
- Non-regulatory products such as depth grids and velocity grids

Question/Comment

- I am out of the mapped floodplain so I am safe and don't need flood insurance.

Response

- A floodplain map is our best estimate of where flood waters will go under very specific conditions. Other areas do flood and flood insurance is inexpensive if you are out of a mapped flood zone.
- Channel Migration Zone (CMZ) maps are helpful to show potential for channel migration.



Channel Migration Zone Map



Question/Comment

- The big flood of 2011 (or whatever year) didn't reach our house so we aren't in the floodplain and your map is wrong.

Response

- Check USGS gaging data and determine magnitude of that flood. People seem to think every flood is the 100-year flood. Often the flood mentioned is much smaller, on the order of a 10-year event.
- Note that all streams/rivers don't end up with a 100-year event the same year.
- Note: The landowner might be right! That is a tough one and it takes \$\$ to show the map is wrong and correct it.

Question/Comment

- Why should you be able to tell me what I can do on my property? (Usually in reference to wanting to make a major change to the stream/river).

Response

- “Your proposed project has the potential to impact your neighbor. If your neighbor was proposing a river project, wouldn’t you want someone to review that project to ensure it doesn’t impact you?”

Questions?

